SMALL DEPRESSION DRAWDOWN MEADOW (TYPIC SUBTYPE)

Concept: Small Depression Drawdown Meadows are herbaceous communities of seasonally flooded mineral soil depressions with fairly long hydroperiods. They may fill a basin but often occur as outer zones surrounding open water or marshy ponds. Most occur in limesink depressions, with occasional examples in inland dune swales or other natural depressions but generally not in clay-based Carolina bays. These communities have longer hydroperiods than Vernal Pools and shorter than Small Depression Pond communities. The Typic Subtype covers the more widespread examples that lack the abundant *Sphagnum* and other strongly acid-tolerant plants characteristic of the Boggy Pool Subtype. The Typic Subtype examples often have high species richness.

Distinguishing Features: Small Depression Drawdown Meadows are distinguished from Vernal Pools by having a longer hydroperiod, with standing water or saturated soil persisting well into the growing season. Flora intolerant of longer flooding, such as *Panicum virgatum, Saccharum giganteum, Carex glaucescens, Aristida virgata, Woodwardia virginica, Aristida palustris, Schizachyrium scoparium,* and any of several *Andropogon* species, are absent, are confined to the shallowest edges, or invade only for short periods during drought. *Hymenachne (Panicum) hemitomon, Rhynchospora tracyi, Rhynchospora inundata, Rhynchospora careyana, Leersia hexandra, Coelorachis rugosa, Diodia virginiana, Rhexia aristosa, Juncus repens, Centella asiatica, Kellochloa (Panicum) verrucosa, Lachnanthes caroliniana, Eleocharis tricostata, Coleataenia (Panicum) rigidula* or plants tolerant of even wetter conditions are generally present, though they may not be visible during drought.

Small Depression Drawdown Meadows are distinguished from Cypress Savannas by occurring in different kinds of basins and being floristically distinct. Plants that are characteristic of Cypress Savanna and uncommon in Small Depression Ponds include *Coelorachis rugosa, Eriocaulon compressum, Erianthus giganteus, Diodia virginiana,* and *Hypericum cistifolium*. Plants characteristic of Small Depression Drawdown Meadows and not of Cypress Savannas include *Centella asiatica, Lachnanthes caroliniana, Panicum tenerum, Juncus pelocarpus (abortivus),* and *Proserpinaca pectinata*. Some plant species, such as *Dichanthelium erectifolium, Dichanthelium wrightianum, Polygala cymosa, Rhexia aristosa, Pluchea baccharis (rosea), Scleria reticularis, Eupatorium leucolepis,* and *Kellochloa* may be frequent in either subtype. Cypress Savannas occur in flat-bottomed basins, while Small Depression Drawdown Meadows generally occur in more sloping basins, often in association with wetter subtypes.

Small Depression Drawdown Meadows are distinguished from Small Depression Pond communities, which they often adjoin, by a diverse flora that is not tolerant of longer flooding, and by the presence of mineral soil. The wetter pond communities tend to have a least some muck accumulation in the soil, which is visible even during dry periods. Small Depression Drawdown Meadow vegetation generally consists of small-to-medium size graminoids and abundant forbs, in contrast to the large emergent graminoids or floating aquatic plants of wetter Small Depression Pond communities. An sparse canopy of *Taxodium ascendens, Nyssa biflora, Acer rubrum,* or several kinds of shrubs may be present in either. During unusually wet periods, Small Depression Drawdown Meadows may remain flooded; the less flood-tolerant plants may not be visible and rhizomatous marsh graminoids may expand and become dominant. However, these communities will still lack the more flood-tolerant plants that are slower to invade and will lack a mucky soil.

It will generally help to know whether water levels are higher or lower than usual and to interpret communities in this light.

The Typic Subtype is distinguished from the Boggy Pool Subtype by having a diverse flora that is not confined to the most acid-tolerant species such as *Anchistea virginica* and *Carex striata. Sphagnum* is generally limited or absent.

Synonyms: *Dichanthelium wrightianum - Dichanthelium erectifolium* Herbaceous Vegetation (CEGL004105), Small Depression Pond (3rd Approximation). Small Depression Drawdown Meadow/Savanna (Pond Margin Subtype) (earlier 4th approximation guide drafts).
Ecological Systems: Southern Atlantic Coastal Plain Depression Pondshore (CES203.262).

Sites: Small Depression Drawdown Meadows usually occur in limesink depressions but may occur in relict dune swales or other depressions.

Soils: Soils are sandy, loamy, or clayey mineral soils. Many examples are small enough that they are usually treated as inclusions in upland soil units in soil surveys, while others are mapped as water.

Hydrology: Surface water is shallow to moderate, usually a few inches to a couple feet deep at the most. Water persists well into the growing season but is gone before the end of summer in ordinary years. The soil may remain saturated for much or all of the rest of the year.

Vegetation: The vegetation is dominated by a dense herbaceous layer of small to medium size graminoids and forbs. The dominant species and overall flora are highly variable from place to place and sometimes from year to year. In 22 CVS plots representing this community, only a handful of species had constancy above 50%. The most constant species, also often abundant, are *Centella asiatica* and *Lachnanthes caroliniana*. Other frequent and sometimes abundant species in plot data include *Euthamia caroliniana, Dichanthelium erectifolium, Dichanthelium wrightianum, Eriocaulon compressum, Scleria muhlenbergii, Drosera intermedia,* and *Rhexia cubensis*. Other species sometimes abundant in plot data and/or in site descriptions include *Coelorachis rugosa, Eupatorium mohrii, Eupatorium leucolepis, Ludwigia suffruticosa, Pluchea baccharis, Polygala cymose, Panicum tenerum, Coleataenia longifolia* var. *combsii, Proserpinaca pectinata, Dichanthelium erectifolium, Rhynchospora perplexa, Eriocaulon decangulare, Ludwigia linifolia, Ludwigia linearis, Ludwigia suffruticosa, Eleocharis melanocarpa, Muhlenbergia torreyana,* and several other *Eleocharis* and *Rhynchospora* species. *Hymenachne hemitomon* may be present, even moderately abundant, but not dominant. Other species of wetter zones, such as *Rhynchospora tracyi* and even *Nympha odorata,* may be present in small numbers. Species of Vernal Pool, such as *Panicum virgatum* and *Andropogon* spp. may be present but do not dominate under normal water conditions. The Typic Subtype is often has high species richness compared to most Coastal Plain Depression Communities. The CVS plots averaged 24 species plots, with most plots being only 10 meters square.

Though the herbaceous layer is the dominant vegetation, woody plants may be present at low to moderate density. *Litsea aestivalis* sometimes occurs scattered in this community, and sparse *Vaccinium fuscatum, Vaccinium formosum, Cyrilla racemiflora, Ilex myrtifolia* may be present.

Nyssa biflora or *Taxodium ascendens* may be present as scattered or sparse trees but not as a well-developed canopy. Small *Pinus taeda* are often present after periods of drought.

Range and Abundance: Ranked G2?. Examples occur in the southern half of the Coastal Plain, including a few in the Sandhills, but most are concentrated in several clusters from Carteret to Brunswick County. The synonymized association ranges from North Carolina to Mississippi. The association as defined probably is less rare than the G2 rank suggests, but it likely represents several unrecognized associations.

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Associations and Patterns: Small Depression Drawdown Meadows often occur as zones in association with Small Depression Pond communities, sometimes with Vernal Pool, and often with Small Depression Shrub Border, but they can also fill an entire depression. The depressions may be isolated but often are clustered, so that multiple patches of this community and several other Coastal Plain Depression Communities occur close by. The surrounding landscape generally is some kind of longleaf pine community.

Variation: The Typic Subtype shows more variation than most communities in this document, including substantial changes among years as well as differences between basins and heterogeneity within single patches. Descriptions of individual ponds are sometimes organized around multiple zones within the area recognizable as Small Depression Drawdown Meadow, varying in wetness and dominant plants. At the same time, the boundary with adjacent communities such as Small Depression Pond (Typic Marsh Subtype) or Vernal Pool can be unclear because species of some zones are shared with them. While it appears undesirable to define more finely divided zones within a given pond as subtypes, the Typic Subtype may be split in the future into two or more subtypes that are related to basin configuration or biogeography. Richard LeBlond, in a series of Natural Heritage Program documents and communications, suggested that steeper-sided basins, flatter basins, and basins with outlets that stabilized their water levels might be significantly different. Differences between Small Depression Drawdown Meadows of the outer Coastal Plain and those of the Sandhills also warrant investigation. From the viewpoint of fauna, there may be important consistent differences between Small Depression Drawdown Meadows associated with Small Depression Ponds and those where it is the wettest community in the basin. At present, no variants are defined.

Dynamics: Small Depression Drawdown Meadows are unusually dynamic on several different scales. The normal annual cycle of flooding and drawdown causes substantial changes in the environment, allowing different plants to become active and shifting the smaller fauna from aquatic to terrestrial. Variation in water levels from year to year and in longer climatic cycles can result in substantial changes in vegetation. As in Cypress Savanna, long term seed banking may be important. However, since Small Depression Drawdown Meadows more often occur in zones surrounded by wetter or drier communities, migration of species within a basin may be more important. The wettest climatic cycles likely are important for keeping uncharacteristic species such as *Pinus taeda* out of the community. In drier periods, fire likely burned into or through the meadows, and this too is probably important for excluding uncharacteristic species.

In limesink complexes, the most frequent habitat of Small Depression Drawdown Meadows, rarer but more permanent changes can also occur. At least one sinkhole newly appeared a few years ago. Continued underground solution could also permanently change existing sinkholes.

Comments: The classification of what is now called Small Depression Drawdown Meadow has been one of the most difficult to resolve. The boundaries with adjacent wetter and drier communities, the clarification of the range of variation over time in individual sites, and the possible recognition of variants or finer subtypes particularly need further investigation. The relationship with Cypress Savanna and with various sites called depression meadows needs more clarification. Both plot data and site descriptions pose problems in sorting out these communities because they can include portions of other communities.

The classification and naming of this community have varied substantially, reflecting their complexities and limited understanding. Drawdown zones were treated in the 3rd Approximation as part of a more heterogeneous Small Depression Pond community type. Earlier drafts of the 4th Approximation called it Small Depression Drawdown Meadow/Savanna, suggesting a closer relationship to Cypress Savannas. Other sources have called them Coastal Plain pond shore communities, emphasizing their relationship to communities with that name in states farther north.

Rhynchospora filifolia - *Juncus abortivus* Herbaceous Vegetation (CEGL004131) is another Coastal Plain small depression association attributed to North Carolina. It may overlap the concept of Small Depression Drawdown Meadow or of Vernal Pool.

Rare species: Vascular plants: *Agalinis virgata, Bacopa caroliniana, Carex verrucosa, Cladium mariscoides, Cyperus lecontei, Eleocharis elongata, Eleocharis melanocarpa, Eleocharis robbinsii, Eupatorium leptophyllum, Lindera melissifolia, Litsea aestivalis, Ludwigia linifolia, Ludwigia suffruticosa, Rhexia aristosa, Rhynchospora harperi, Rhynchospora pleiantha, Rhynchospora tracyi, Saggitaria isoetiformis, Scleria reticularis,* and *Utricularia olivacea*. A large number of watch list plants, many tracked until recently, also are associated, including *Agalinis linifolia, Dichanthelium erectifolium, Panicum tenerum, Rhynchospora scirpoides, Scleria georgiana, Xyris flabelliformis*, *Xyris iridifolia*, and *Xyris smalliana*.

Animals: *Ambystona tigrinum, Dierochelys reticularis, Hyla andersoni, Rana capito*, and more rarely *Alligator mississippiensis*.

References: